

Developing Speleologic Geodatabases for the Purposes of Research and Protection of Geoheritage of Croatia

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Abstract

Croatia is characterized by a high level of geodiversity and numerous geoheritage sites thanks to the geological and geomorphological position of Croatia, even though it is a medium scale country by European standards. The geodiversity is the result of the special position on the contact-zone of large geosystems like Pannonian Basin, Dinarides, Adriatic and the Alps. Considering the number, density, value and preservation of geosites and the general natural diversity of Croatia, the areas of karst and fluviokarst relief are especially valuable. In addition to the geological, geomorphological and hydrological values of karst and fluviokarst relief, their uniqueness are underground morphological features – speleological phenomena. Under their specific conditions, specific underground ecosystems developed, which makes caves important sites of biodiversity. Caves have preserved valuable sediment complexes, the research of which may provide important information on climate and environmental conditions of the geological past or valuable paleontological and cultural data important for the study of life on Earth.

Caves in Croatia occur in zones of relief molded in carbonate rocks in the following mega-geomorphological regions: (I) Dinaric system of Croatia, which includes inland caves and submerged or semi-submerged caves of the Adriatic Sea, and (II) areas of isolated karst of the Croatian Zagorje, Medvednica Mt., Banovina and Slavonian mountains in the region of the Pannonian Basin. As elements of interest of the geomorphological heritage, speleological phenomena are declared protected natural values on the basis of the Nature Protection Act of Croatia, mainly as natural monuments. Many caves are located within the larger protected areas, and some of them make important sites for the species and habitat types within the NATURA 2000 ecological network. Caving associations, professional and relevant public institutions collaborate in their research and protection. Therefore, caving databases are of great importance in the spatial management and the management of protected areas. They develop as special databases or may be a part of a complex geomorphological database. An example of an independent database is the Speleological database of Samobor hills, developed through the project of the Caving Club Samobor for the purposes of the Public Institution Green Ring of Zagreb County. The database consists of a textual component, cadastral (identification) records with spatial and speleological attributes customized to the needs of research, monitoring, space management and protection of nature. In addition, the geospatial database can be managed in different formats, it has various thematic maps, cave plans and georeferenced photos. Lastly, a KML/KMZ layer has been prepared for the Nature Protection GIS which allows a quick overview for users, provides insight into the basic information within Google Earth, importing data in mobile mapping applications (Orux, Locus Maps, and Google Earth) and facilitates field work. Similar databases were also made for other areas

such as the Žumberak-Samobor Nature Park, Risnjak National Park, Cave Park Grabovača and others.

Keywords: Key Words: geoharitage, caves, karst, databases, GIS